**Result**In this study, we investigated the influence of BMI on postoperative outcomes in a cohort of 157 surgical patients. Patients were categorized into four groups based on their BMI, underweight (n=2), normal (n=21), overweight (n=74) and obese group (n=60).  
demographic and preoperative characteristics are summarized in **table 1**. the mean age varied among the groups, with the underweight group having the highest mean age (67.50 ± 0.71 years) and the overweight group having the lowest (60.93 ± 9.03 years), though these differences were not statistically significant (p-value = 0.605). Male predominance was observed in all groups, with most males in the overweight group (66 males). regarding Serum creatinine (S. creatinine) (p-value = 0.548), aspartate transaminase (AST) (p-value = 0.250) and alanine transaminase (ALT) (p-value = 0.391) levels showed no significant difference across groups. Off-pump surgery was the predominant approach across all BMI categories: underweight (100%), normal (76.2%), overweight (85.1%), and obese (83.3%). Highest HBA1C levels were noted in the normal group (7.28 ± 1.85%) and the lowest levels in the overweight group (6.82 ± 1.43%), but the overall difference lacked significance statistically (p-value = 0.680).

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| **Table 1:** demographic and preoperative characteristics of patients. | | | | | |
| Variables | Underweight (n=2) | Normal (n=21) | Overweight (n=74) | Obese (n=60) | p-value |
| Age | 67.50 ± 0.71 | 62.86 ± 7.14 | 60.93 ± 9.03 | 61.33 ± 8.44 | 0.605 |
| Gender (Male) | 2 | 21 | 66 | 39 |  |
| S.creatinine (mg/dL) | 1.05 ± 0.21 | 1.01 ± 0.27 | 1.03 ± 0.24 | 1.08 ± 0.79 | 0.548 |
| AST | 25.25 ± 1.77 | 19.21 ± 8.41 | 22.83 ± 11.02 | 21.64 ± 8.43 | 0.250 |
| ALT | 27.75 ± 7.42 | 22.82 ± 15.88 | 25.65 ± 13.82 | 24.76 ± 12.15 | 0.391 |
| PT (sec) | 13.95 ± 1.06 | 14.31 ± 1.42 | 14.23 ± 1.00 | 13.87 ± 1.93 | 0.801 |
| EF (%) | 64.00 ± 5.66 | 51.62 ± 10.83 | 54.97 ± 9.31 | 53.47 ± 9.22 | 0.159 |
| Hb (g/dL) | 13.05 ± 0.64 | 13.11 ± 1.57 | 13.24 ± 1.70 | 13.14 ± 1.68 | 0.923 |
| WBC (×10³/µL) | 8.20 ± 2.97 | 7.27 ± 1.70 | 7.83 ± 2.29 | 8.02 ± 2.00 | 0.714 |
| HbA1C (%) | 6.92 ± 1.39 | 7.28 ± 1.85 | 6.82 ± 1.43 | 7.03 ± 1.28 | 0.680 |
| **Type of surgery** |  |  |  |  | 0.899 |
| Off pump | 2 | 16 | 63 | 50 |  |
| On pump | 0 | 4 | 10 | 8 |  |
| Conversion to bypass | 0 | 1 | 1 | 2 |  |
| Values are shown as mean± (standard deviation). AST, aspartate transaminase; ALT, alanine transaminase; PT, prothrombin time; EF, ejection fraction; Hb, hemoglobin; WBC, white blood cell; HbA1C, glycated hemoglobin. | | | | | |

As **table 2** presents, the incidence of multi-vessel disease varied significantly across the groups, specifically, 100% of the patients with normal BMI, 94% of overweight and 81% of the obese patients were diagnosed with multi-vessel disease, with the difference reaching statistical significance (p-value = 0.006). in contrast, regarding all the other comorbidities evaluated, including hypertension (p-value = 0.225), ischemic heart disease (p-value = 0.884), chronic lung disease (p-value = 0.884), chronic kidney disease (p-value = 0.942), and diabetes mellitus (p-value =0.906), no significant difference was observed across the groups.

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| Table 2: chronic disease and comorbidity across the BMI groups. | | | | | |
| Variables | Underweight (n=2) | Normal (n=21) | Overweight (n=74) | Obese (n=60) | p-value |
| Multi-vessel disease | 1 | 21 | 70 | 49 | 0.006 |
| HTN | 1 | 10 | 24 | 29 | 0.255 |
| IHD | 0 | 1 | 2 | 1 | 0.884 |
| Chronic lung disease | 0 | 1 | 2 | 1 | 0.884 |
| CKD | 0 | 1 | 5 | 4 | 0.942 |
| DM | 1 | 15 | 48 | 39 | 0.906 |
| Liver disease | 0 | 0 | 0 | 2 | 0.274 |
| DM, diabetes mellitus; HTN, hypertension; CKD, chronic kidney disease; IHD, ischemic heart disease. | | | | | |

Intraoperative characteristics and outcomes are summarized in **table 3**. The longest surgery duration was observed in the normal BMI group, with a mean of 5.60 ± 1.78 hours, while the underweight group had the shortest duration at 4.00 ± 2.83 hours, however the difference couldn’t reach significance statistically (p-value = 0.226). no significant difference regarding urgency of the operation was found, though the number of the patients in each group varied (underweight = 0, normal = 3, overweight = 4, and obese = 5, p-value = 0.226). intraoperative support usage varied significantly across the groups (p-value = 0.007), with both overweight and obese groups showing the highest usage of dobutamine (45 patients in each group), while noradrenaline was administered exclusively in the overweight group. Significant Variation was observed in arterial blood gas (ABG) parameters, with notable difference in PO2 and worst blood glucose levels, highest PO2 levels were detected in the underweight group (326.50 ± 273.65) (p-value = 0.049), pairwise comparison between overweight and obese group revealed a statistically significant difference in PO2 levels (165.34 ± 99.97 vs 132.28 ± 86.44, p-value = 0.026), regarding worst blood glucose levels there were a significant difference between the groups (p-value = 0.009), by being the highest in the normal group, A pairwise comparison between normal and overweight group demonstrated a significance difference (123.00 ± 5.66 vs 201.50 ± 44.60, p-value = 0.012).

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| **Table 3:** intraoperative variables and outcomes across the BMI groups. | | | | | |
| Variables | Underweight (n=2) | Normal (n=21) | Overweight (n=74) | Obese (n=60) | p-value |
| Surgery Duration (Hours) | 4.00 ± 2.83 | 5.60 ± 1.78 | 4.92 ± 1.10 | 4.85 ± 1.60 | 0.226 |
| Urgency of the operation (urgent) | 0 | 3 | 4 | 5 | 0.683 |
| Intra operative mortality | 0 | 1 | 1 | 1 | 0.830 |
| **Intra support** |  |  |  |  | 0.007 |
| Dobutamine | 2 | 9 | 45 | 45 |  |
| Dobutamine, Adrenaline | 0 | 0 | 3 | 0 |  |
| Dobutamine, Adrenaline, Noradrenaline | 0 | 5 | 1 | 0 |  |
| Noradrenaline | 0 | 0 | 3 | 0 |  |
| **ABG** |  |  |  |  |  |
| PH | 7.33 ± 0.15 | 7.30 ± 0.10 | 7.32 ± 0.06 | 7.31 ± 0.07 | 0.464 |
| PO2 | 326.50 ± 273.65 | 159.72 ± 139.07 | 165.34 ± 99.97 | 132.28 ± 86.44 | 0.049 |
| PCO2 | 37.60 ± 10.47 | 44.72 ± 11.19 | 41.12 ± 7.06 | 44.09 ± 7.61 | 0.078 |
| HCO3 | 21.65 ± 0.92 | 20.61 ± 2.34 | 20.59 ± 1.40 | 21.43 ± 3.52 | 0.232 |
| Lactate | 1.95 ± 1.63 | 3.44 ± 3.62 | 2.12 ± 1.11 | 2.37 ± 2.44 | 0.335 |
| Worst Blood Glucose (ABGs) | 123.00 ± 5.66 | 236.62 ± 57.60 | 201.50 ± 44.60 | 210.32 ± 60.32 | 0.009 |
| Values are shown as mean± (standard deviation). ABG, arterial blood gas; PO2, partial pressure of oxygen; PCO2, partial pressure of carbon dioxide; HCO3, Bicarbonate (ion). | | | | | |

Postoperative outcomes (**Table 4**), revealed that the obese group had the longest ICU stay with a mean of 20.76 ± 17.75 hours, significantly longer compared to the other groups (p-value = 0.007), a pairwise comparison between the overweight and obese group, showed statistically significant difference in ICU stay (20.76 ± 17.75 vs 15.32 ± 8.12 hours, p-value = 0.019). The normal group had longest hospital stay compared to the other groups, but the difference significant statistically (p-value = 0.371). in the other hand ABG parameter demonstrated variability across the groups. With the PCO2 being the highest in the obese group and the lowest levels was exhibited in the overweight group (43.50 ± 7.38 vs 38.19 ± 6.81, p-value = 0.001). Additionally, a pairwise comparison between the obese group and the overweight groups regarding PH showed significance difference between these two groups (7.34 ± 0.07 vs 7.38 ± 0.08, p-value = 0.015).

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| **Table 4:** postoperative outcomes across BMI groups. | | | | | |
| Variables | Underweight (n=2) | Normal (n=21) | Overweight (n=74) | Obese (n=60) | p-value |
| Hours stayed in ICU | 8.50 ± 4.95 | 16.35 ± 5.81 | 15.32 ± 8.12 | 20.76 ± 17.75 | 0.007 |
| Total Days Stayed in Hospital | 4.00 ± 1.41 | 7.80 ± 10.76 | 5.22 ± 2.06 | 5.39 ± 2.06 | 0.371 |
| Mortality in ICU | 0 | 0 | 1 | 0 | 0.682 |
| EF (%) | 58.00 ± 0.00 | 49.95 ± 8.97 | 52.84 ± 7.82 | 53.08 ± 8.0 | 0.187 |
| S. Creatinine (mg/dL) | 0.90 ± 0.14 | 1.11 ± 0.44 | 1.08 ± 0.36 | 1.36 ± 1.18 | 0.540 |
| Hb (g/dL) | 9.90 ± 1.84 | 9.70 ± 1.44 | 10.20 ± 1.57 | 10.34 ± 1.52 | 0.439 |
| WBC (×10³/µL) | 14.15 ± 0.35 | 14.29 ± 3.70 | 13.98 ± 3.89 | 14.26 ± 3.87 | 0.840 |
| **ABG** |  |  |  |  |  |
| PH | 7.34 ± 0.14 | 7.37 ± 0.09 | 7.38 ± 0.08 | 7.34 ± 0.07 | 0.023 |
| PO2 | 397.00 ± 121.62 | 130.41 ± 89.20 | 115.39 ± 93.16 | 127.29 ± 94.80 | 0.049 |
| PCO2 | 40.75 ± 10.11 | 38.84 ± 8.27 | 38.19 ± 6.81 | 43.50 ± 7.38 | 0.001 |
| HCO3 | 21.65 ± 2.90 | 21.89 ± 2.70 | 24.95 ± 24.32 | 22.33 ± 2.97 | 0.838 |
| Lactate | 4.25 ± 4.60 | 3.39 ± 2.80 | 2.85 ± 1.80 | 3.29 ± 2.30 | 0.899 |
| Post Worst Blood Glucose (ABG) | 212.00 ± 60.81 | * 1. 58.48 | 218.26 ± 53.05 | 229.39 ± 54.88 | 0.622 |
| Values are shown as mean± (standard deviation). ICU, intensive care unit; S. creatinine, serum creatinine; HB, hemoglobin; WBC, white blood cell count; ABG, arterial blood gas; PO2, partial pressure of oxygen; PCO2, partial pressure of carbon dioxide; HCO3, Bicarbonate (ion). | | | | | |

Postoperative complications didn’t show any significant differences between the groups, although there were some variations in certain complications, such as bleeding >1000ml, which had the highest incidence in the overweight group compared to the others (p-value = 0.877). two patients in the overweight group underwent reoperation, while no patient required reoperation in the other groups (p-value = 0.389).

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| Table 5: postoperative complications across BMI groups. | | | | | |
| Variables | Underweight (n=2) | Normal (n=21) | Overweight (n=74) | Obese (n=60) | p-value |
|  |  |  |  |  |  |
| Respiratory Failure | 0 | 5 | 25 | 16 | 0.471 |
| Bleeding >1000ml without Reoperation | 1 | 5 | 22 | 16 | 0.877 |
| Readmission to ICU | 0 | 2 | 0 | 1 | 0.092 |
| Reoperation | 0 | 0 | 2 | 0 | 0.389 |
| Acute Kidney Injury | 0 | 2 | 12 | 9 | 0.752 |
| Postoperative Myocardial Infarction | 0 | 1 | 2 | 0 | 0.348 |
| Stroke | 0 | 2 | 2 | 1 | 0.451 |
| Shock | 0 | 1 | 0 | 3 | 0.142 |
| Atrial Fibrillation | 0 | 0 | 1 | 4 | 0.232 |
| Pneumonia | 0 | 1 | 1 | 1 | 0.819 |
| Liver Failure | 0 | 2 | 0 | 3 | 0.060 |
| Pleural Effusion | 0 | 1 | 2 | 2 | 0.947 |
| Prolonged ICU Stay >72 hrs | 0 | 1 | 2 | 1 | 0.876 |
| Values represent the number of patients with each complication. ICU, intensive care unit. | | | | | |